

Copyright
by
Gretchen Marie Kasting
2013

**The Report Committee for Gretchen Marie Kasting
Certifies that this is the approved version of the following report:**

**Without Contraries There is No Progression: Scientific Speculation and
Absence in *Frankenstein*, *Strange Case of Dr Jekyll and Mr Hyde*, and
“The Colour Out of Space”**

**APPROVED BY
SUPERVISING COMMITTEE:**

Supervisor:

Elizabeth Hedrick

Allen MacDuffie

**Without Contraries There is No Progression: Scientific Speculation and
Absence in *Frankenstein*, *Strange Case of Dr Jekyll and Mr Hyde*, and
“The Colour Out of Space”**

by

Gretchen Marie Kasting, B.A.

Report

Presented to the Faculty of the Graduate School of

The University of Texas at Austin

in Partial Fulfillment

of the Requirements

for the Degree of

Master of Arts

The University of Texas at Austin

May 2013

Dedication

I would like to dedicate this report to my family and friends, without whom I would not have found the determination to complete this project. In particular, I dedicate this to my cohort, who, by being in the same boat with me, helped me stay afloat. Finally, I would also like to dedicate this report to PrivateerFish, Wiebelwiebel, arcadie, LadyScale, InsanityRed, egwolf65, 2dreamsandcaster2, Lacertae, p3x, Random_Sedan, Meganbobness, Yevynaea, AsheRhyder, Emerald Embers, evemari, ObsidianJade, LithFider, Perfumer, PrinceofBadassery, aNGELICmURDER, MaryPSue, erikaskyeaeri, mastersfav, itchybrownsweater, amaronith, Judas, taiyari, Heartofasong, Micromyni, inc4ssum, Icka M Chif, kitaruheart, KandriLynZinael, Hayate, Keyanna, General_Button, Devkyu, Neyiea, Pandigital, Ennead13x, sycamoreleaf, DragonMasterKris, Glar, and thismightyneed, who encouraged me in an entirely different writing project that helped keep me sane while working on this one.

Acknowledgements

I would like to thank my readers, Beth Hedrick and Allen MacDuffie, for their support, guidance, and understanding throughout this project.

Abstract

Without Contraries There is No Progression: Scientific Speculation and Absence in *Frankenstein*, *Strange Case of Dr Jekyll and Mr Hyde*, and “The Colour Out of Space”

Gretchen Marie Kasting, MA

The University of Texas at Austin, 2013

Supervisor: Elizabeth Hedrick

Due to their inclusion of characters or objects that are the result of scientific investigation or subject to scientific scrutiny, *Frankenstein*, *Strange Case of Dr Jekyll and Mr Hyde*, and “The Colour Out of Space” are works that may be classified as science fiction. However, despite these narratives’ engagement with scientific practice, at crucial moments when scientific description would be expected, it is prominently absent. This report investigates the effects of these absences within the narratives and suggests that such absences do not appear due to the author’s unfamiliarity with the science of her or his era, but rather serve the positive purpose of creating the effect of the sublime through horror, which is most effective when the reader is forced to confront the unknown or unreadable. To corroborate this hypothesis, this report also examines the treatment of certain hybrids within the three stories and the way that the terror they inspire seems to rely on the ways in which they mingle the known with the unknown and resist coherent description. Overall, this report seeks to illuminate the complex interaction of the known

and the not yet known that has enabled a fruitful interaction between science fiction and horror as genres since the inception of science fiction as a definable genre.

Table of Contents

Text.....	1
Section I.....	6
Section II.....	21
Section III.....	31
Bibliography	44

When light is expected and only darkness is given, what can the response be but fear? When one is prepared to encounter an illuminated description of some safe, comprehensible, and beautiful thing and only an absence is presented, the fascination that prompted one to seek the illumination in the first place does not vanish in the absence of such description, but may easily be transmuted into terror. Much has been written about such moments in regard to the gothic, particularly as they relate to Edmund Burke's ideas of the sublime and beautiful in *A Philosophical Enquiry Into the Origin of Our Ideas of the Sublime and Beautiful*. But less has been said about such moments in science fiction, though they are widespread and persistent. Like other revelations and other forms of knowledge made to be comprehensible and known to the human mind, scientific knowledge can be considered beautiful.¹ However, science fiction cannot work only with beautiful knowledge. It is the very nature of science fiction to be speculative and thus push into the unknown that always surrounds the known.² To further illuminate the

1 I am aware that the predominant narrative of the time frame I am examining, including, as it does, the Victorian era and its many scientific controversies, such as those surrounding Darwin and others' theories of evolution, often portrays scientific knowledge as frightening and inhuman, while alternatives embracing obscurity such as religion and mysticism are considered as systems that were turned to for comfort. However, I argue that it is possible to see public fear-reactions to scientific discoveries as the fear-reaction to what still remains unknown, given these discoveries. Scientific knowledge is always incomplete, and may be frightening because it explains too little, not too much. The supposed obscurity of religious and mystic systems discounts that, though not empirically backed, they are systems and they do claim to offer complete answers. Scientific investigation offers a light that cannot ignore the unknown existing outside such illumination, and therefore is both a source of reassurance when one remains within the spotlight of the known, and a source of fear when that boundary is pushed—as I will show in the works of science fiction I discuss below.

2 While the “nature of science fiction” as I phrase it, and the definition of the genre as a whole often prove contentious, in this essay I draw from the lucid views of Darko Suvin to provide such a working definition. Suvin writes that science fiction “*is...a literary genre whose necessary and sufficient conditions are the presence and interaction of estrangement and cognition, and whose main formal device is an imaginative framework alternative to the author's empirical environment*” (8). In other words, science fiction demands new ways of thinking, that what is known become unknown, and the presence of the

significance of this generic dependence, I draw together quotes from either end of the century-long timespan this essay will discuss. H.P. Lovecraft, whose “The Colour Out of Space” will be examined below, wrote in *Supernatural Horror in Literature* that “the oldest and strongest emotion of mankind is fear, and the oldest and strongest kind of fear is fear of the unknown” (12). Analogously, Burke’s initial description of the sublime is “whatever is fitted in any sort to excite the ideas of pain, and danger, that is to say, whatever is in any sort terrible, or is conversant about terrible objects, or operates in a manner analogous to terror, is a source of the *sublime*; that is, it is productive of the strongest emotion which the mind is capable of feeling” (13). These two perspectives suggest that we may see the way in which science fiction, by carefully manipulating its position on the boundary between the known and the unknown, may thus achieve the highest level of emotional effect—the sublime—from a starting point in fear. Science fiction, as a genre that continuously pushes on the boundary between the unknown, has access to the oldest and strongest kind of fear, according to Lovecraft, and thus, in Burke's terms, is in this way capable of producing the most sublime feelings. This fear, in science fiction, comes not from the presence of supernatural entities, but from the absence of appropriate explanation for phenomena otherwise considered within the purview of science. Such moments of horror, enhanced by absence, occur in each of the three pieces I have selected for this essay: *Frankenstein*, by Mary Shelley; *Strange Case of Dr Jekyll and Mr Hyde*, by Robert Louis Stevenson; and “The Colour Out of Space”,

unknown/not yet known. It does not allow the categories of known and unknown to remain stable. This essay then, seeks to examine some of the results of that necessary instability.

by H. P. Lovecraft.³ In all these works, crucial moments of scientific inquiry and description are refused. These refusals heighten the impact of the scenes in which they appear by increasing the fear such scenes cause and thus bringing them closer to the ideal of the sublime. These moments of absence reveal the gothic side of science fiction and demonstrate the tendency of the genre to always bump up against the unknown and thus the terrifying as well. However, it is also important to note that despite a certain familial resemblance between science fiction and the gothic, for the writers included in this essay, scientific trappings are not simply a way of putting the supernatural of the gothic in drag. Shelly, Stevenson, and Lovecraft were all acquainted with the contemporary science of their respective eras to certain degrees, and none of the three was restricted by ignorance when facing the prospect of scientific description in their works. Instead, the approaches to scientific description and the notable absences of such were informed by an understanding of both science and its limits, as demonstrated by the varying degrees of

3 Before traveling further into the essay, I offer a brief justification of my choice to use these particular texts from the many possibilities that presented themselves. *Frankenstein* deserves a place here as a text that is frequently named among the first science fiction novels yet has also become an iconic horror story. By using Shelley's novel I will be able to show that the moments of horror and sublimity based on the interactions of the known and unknown have been pervasive in science fiction nearly since it could be defined as such. *Strange Case of Dr Jekyll and Mr Hyde* is in a similar position: It is another piece of early science fiction that has been culturally perceived as horror. Less well known, and thus requiring more justification, is "The Colour Out of Space". Why did I not, for example, choose a work by H.G. Wells, an unarguable pioneer of science fiction? His *The Time Machine* and *The Island of Dr. Moreau* have apt moments of horror, to be sure. I chose the piece by Lovecraft, however, because I wished to continue my selection of works and authors that are icons of horror, and, in this case, horror that stems from the interaction between the known and the unknown in scientific investigations. Wells, in contrast to the authors here, has never seemed, in his afterlife, to have such a strong association with horror. Yes, there are terrifying moments in his works, but he does not produce the same cross-genre effect I find in the authors present here. The works I have chosen, I hoped only to have to justify as science fiction, since they are already popularly known as horror. I also wished to make the timespan of my investigation broader, and the scope transatlantic, to add to my assertion that the source and tenor of the horror that can be found in science fiction is persistent throughout geographical and temporal differences in the modern Anglo-American tradition.

scientific framing that occur in the three works, which dovetail with the changing views regarding scientists and science over time. In other words, as the amount of available scientific knowledge increased over time and the position of the scientist grew more specialized, the amount of detail that can be included before an absence is required also increases. Additionally, the changing popular perception of the scientist affects how the absences are brought about. Through an examination of the scientific presences and absences in *Frankenstein*, *Strange Case of Dr Jekyll and Mr Hyde*, and “The Colour Out of Space”, the importance and necessity of the intrusion of the unknown, frightening, and sublime into the known beauty of scientific knowledge within science fiction will become apparent, even as an investigation of the historical frame and biographies of the authors demonstrate that such absences do not appear out of ignorance.

The relationship between the sublime, the unknown, and terror within science fiction may be read for greater clarity not simply through Edmund Burke but through a more recent theorist such as Latour. In *We Have Never Been Modern*, Latour argues that in modernity there are three main entities: man, nonhumanity, and “a crossed-out God” (13). He then goes on to state that “modernity arises first from the conjoined creation of those three entities, and then from the masking of the conjoined birth and the separate treatment of the three communities while, underneath, hybrids continue to multiply as an effect of this separate treatment” (13). As more knowledge is classified via those three categories, the unknown and unclassifiable hybrid forms an inevitable mirror image to the known. In considering this claim with Burke’s statements regarding obscurity, namely, “to make anything very terrible, obscurity seems in general to be necessary” and

“when we know the full extent of any danger, when we can accustom our eyes to it, a great deal of the apprehension vanishes” (43), it should become clear that in trying to make things clear, as in scientific inquiries, the obscure is always present as a silent partner, and is always ready to terrify. But such terror brings delight “when we have an idea of pain and danger, without actually being in such circumstances” and “whatever excites this delight, I call *sublime*” (Burke 32). This is the power wielded by Shelley, Stevenson, and Lovecraft when scientific obscurity and absence make their presence known.

Latour’s work with the concept of modernity offers even more insight as to why speculative science fiction, terror, and sublimity can and should be linked. Modernity is not just this tripartite birth of the concepts listed above, but is also a pair of practices used by those who participate in the project of modernity: translation and purification. Translation, according to Latour, “creates mixtures between entirely new types of beings, hybrids of nature and culture” (10). The mirror image of this practice is purification, which “creates two entirely distinct ontological zones: that of human beings on the one hand; that of nonhumans on the other” (Latour 10-11). Purification may be understood as the gathering and use of scientific facts, a means of ordering the world. However, no matter what these known facts are, no matter how carefully they are collected and presented, they are not going to be of use in producing the effect of the sublime, at least in Burke’s sense, “for the appearance of care is highly contrary to our ideas of magnificence” (61). Instead, at some point, to produce the sublime, purification must give way to translation. Eventually, what man knows and what he doesn’t know must mix and

produce an effect that is not entirely under his control. Based on Latour's ideas, this is the inevitable shadow half of the process of gaining knowledge, and, as the works I examine below will show, the translation process and its drawing forth of the sublime is ready to be initiated as soon as the work begins to push on the boundaries of scientific knowledge. Within science fiction, the known and the unknown form terrifying hybrids that are particularly productive of the sublime.

In the three stories examined in this essay—*Frankenstein*, *Strange Case of Dr Jekyll and Mr Hyde*, and “The Colour Out of Space”, evidence appears that the authors are engaging in the purification or illumination process of modernity by including aspects of real science in science fiction works. However, with purification and illumination come translation, hybrids, and darkness that can be used to increase the emotional tenor of the narratives through terror and thus sublimity. All three authors carefully manage the meeting of known science with their speculations into the unknown in order to mark out a space for obscurity to remain as the shadow parallel of the illuminating scientific project. In addition to the moments of absence described below, the conjunction of the unknown with the known, and the horror possible at this conjunction, also is joined to the hybrids that form the respective hearts of all three stories and grow from those moments of absence: they form the clearest examples of horror within their narratives yet still remain obscure and illegible.

I.

Often named as one of the first science fiction novels and extensively studied for this virtue, *Frankenstein*, by Mary Shelley, provides a valuable opportunity to investigate

the phenomenon of scientific absence and the modern purification/translation interaction, not only because of its notorious vagueness regarding the making of the creature, but also because of the existence of two well-defined versions of the text. By contrasting the 1818 and 1831 texts during the moments in the story in which scientific description would seem to be forthcoming, it will be possible to see if any trend appears to exist for Shelley as relates to her attitude towards the power inherent in obscurity.

In both the 1818 and 1831 texts, Victor Frankenstein first encounters scientifically related materials as a child, when he reads the works of medieval authors such as Agrippa and Paracelsus. However, from this point to the end of Volume 1, Chapter 2, the description of Victor's exact scientific education and his reaction to this education diverges. In the 1818 version, Victor states that if his father had not dismissed Agrippa as "sad trash" (64) and had instead explained to him why this ancient writer's works were no longer valid, he "should have probably applied myself to the more rational theory of chemistry which has resulted from modern discoveries" (65). In the 1831 version, Victor does not mention modern chemistry as an alternative to Agrippa, but states more generally that a proper explanation would have prevented him from receiving "the fatal impulse that led to my ruin" (26). This instance of the later edition of the work removing specifically scientific aspects of the first only continues as Victor describes his early education. The 1818 edition includes Victor describing how he observed "distillation, and the wonderful effects of steam" as well as "some experiments on an air pump" (67-8) which excited his wonder because they were not dealt with in the writings of his favored authors. In the 1831 version, such observations are not mentioned, and Victor describes

himself at this point in his childhood as “occupied by exploded systems, mingling, like an unadept, a thousand contradictory theories, and floundering desperately in a very slough of multifarious knowledge” (27). The keen interest Victor shows in reaching a scientific understanding of the world, even at a young age, as shown by his mention of specific types of observations and experiments in the earlier text, is erased in the later version, which presents Victor as a misguided seeker of too many kinds of knowledge—he has become less of a scientist, and more someone oppressed by excessive commingling of disciplines, which is to say, hybridization. What Victor knows and what he *can* know become less clear.

The incident in which Victor observes lightning striking an oak offers another instance in which the later version seems to have striven to become less explicitly scientific than the earlier edition. After the lightning strikes the tree in the 1818 version, Victor asks his father about the nature of lightning, and his father tells him that electricity is the cause, and he “constructed a small electrical machine, and exhibited a few experiments; he made also a kite, with a wire and string, which drew down that fluid from the clouds” (69). This version of events positions Victor’s father as a man of scientific inclinations, and thus offers the reader a fairly clear picture of the specific scientific milieu in which Victor grew up, despite the clouding influence of Agrippa. In the later version of the text, it is not Victor’s father but rather a “man of great research in natural philosophy” (28) who, after the lightning strikes the tree, explains “a theory which he had formed on the subject of electricity and galvanism” (28). The scientific impulse is displaced; a visitor—who and from where we are not told—shows Victor the

cutting edge of science, not one of his own blood. Just as Victor is made less of a scientist in this later version, so Victor's immediate environment is less specifically scientific.

When Frankenstein goes to Ingolstadt and begins the process of making his creature, however, both texts come into agreement regarding the proper degree of scientific erasure or elision required. Even in 1818 Shelley recognizes the necessity of keeping some aspects of Frankenstein's process in the dark. The first notable absence in Frankenstein's description to Walton of what he did occurs as he recounts his work seeking for the causes of life and death and is presented in the same manner in both versions of the text. He describes how he labored over all the aspects of "the change from life to death, and death to life, until from the midst of this darkness a sudden light broke in upon me—a light so brilliant and wondrous, yet so simple, that while I became dizzy with the immensity of the prospect which it illustrated, I was surprised, that among so many men of genius who had directed their enquiries toward the same science, that I alone should be reserved to discover so astonishing a secret" (38). The enthusiasm for his project that is apparent in this sentence seems to indicate that Frankenstein will eagerly begin to describe his discoveries. After all, though he alone possesses the secret at this moment, as a scientist he would be able to gain fame and adulation as he began to share it within the specialized discourse of the scientific community and then the general public. Yet from the context in which Frankenstein speaks this sentence, we as readers know this cannot be the case. He has not gained the world's praise for his great discovery. Somehow this moment has led him to be alone and friendless in the Arctic. The proper dissemination of scientific knowledge does not appear to have occurred in the world of

the novel, so as readers we may begin to suspect that it will not take place in the actual text of the novel in our hands.

Furthermore, it is not only the context of Frankenstein's speech about his discovery that begins to breed uncertainty as to whether the exact nature of the discovery will be related or not. Two negations of the propagation of knowledge are contained within the content of his speech as well. First of all, Frankenstein claims that "among so many men of genius" (38) he was the only one able to make this discovery. That is, whatever discovery he has made, it bears no relation to what is already known and what has already been discovered. Anyone who wants to learn the details of Frankenstein's discovery will have no recourse to his contemporaries or teachers. Frankenstein is the sole keeper of this knowledge. This leads to the second negation of revelation present in this speech, which occurs when Frankenstein refers to the knowledge his investigations have brought him as a "secret" (38). His choice of word immediately implies that he does not necessarily think of this knowledge as a thing to be shared. Will he decide to share it with Walton and therefore the reader? At this point the possibility still remains, but since the description of the revelation ends on the note struck by "secret", the possibility seems less and less likely—after all, secrets are meant to be kept.

After this moment, Frankenstein says that "the stages of the discovery were distinct and probable" yet it "was so great and overwhelming, that all the steps by which I had been progressively led to it were obliterated, and I beheld only the result" (Shelley 1831 38-9). The rational, scientific background for Frankenstein's work is emphasized here by the mention of a step-by-step process. However, this emphasis is immediately

undermined as Frankenstein continues to describe his experience: as soon as he makes his great discovery, the scientific process by which he arrived at it is utterly driven from his mind. Whatever preliminary steps led him to the secret of life and death cannot appear in the novel for the reader, because they have lost all importance for Frankenstein. His (and Shelley's) telling of the story demonstrates that from the narrative position, there can be no going back to see earlier steps, as might be possible in a lab notebook. The strictures of literary convention and the necessity of writing a Frankenstein who is looking back on the past from his unique point of view create a barrier against the fulfillment of any scientific interest that might be aroused by his story.

Following close on the heels of this statement, which only implies that we as readers will probably not be given any scientific explanation, is Frankenstein's explicit acknowledgment that he will keep his discovery secret and any description of his methods vague. He pauses in his narrative to speak directly to Walton, saying, "I see by your eagerness and the wonder and hope which your eyes express, my friend, that you expect to be informed of the secret", but Frankenstein refuses to tell him as he considers it a certainty that such information would lead to "destruction and infallible misery"; he hopes that Walton will come to understand "how dangerous is the acquirement of knowledge" (Shelley 1831 39). And, regardless of how unreliable Frankenstein may or may not be in relation to other matters in the narrative, on this point he is consistent. During the making of the creature the few details given about his work offer little clear idea of what he is doing and serve more as a means of creating an atmosphere that emphasizes the unknown and will eventually open the door to the sublime. He "dabbled

among the unhallowed damp of the grave”, “tortured the living animal”, and worked in “a solitary chamber, or rather cell” (40-1). On the actual night on which the creature is brought to life, all readers are given to know about what is going on at that fatal moment is Frankenstein’s statement that he “collected the instruments of life around me, that I might infuse a spark of being into the lifeless thing that lay at my feet” (43). What are the instruments of life? Is the spark of being literal or metaphorical? This simple statement, however many movie mad-scientists’ labs it has furnished with Jacob’s ladders, provides absolutely no information about what is happening. Such vagueness and lack of information of course corresponds perfectly to Frankenstein’s wish to be circumspect regarding knowledge he feels is too dangerous to share with the world, but it is more than Frankenstein’s trepidation in relation to his scientific work that has led to this intriguing collection of absences in the story.

From outside the narrative, we are aware that the scientific knowledge possessed by the character Frankenstein cannot be too dangerous to share because a) it does not exist and b) there is little indication either in Shelley’s day or ours that such an undertaking as Frankenstein’s would produce a viable result after only two years of work. The reason Frankenstein avoids talking about his scientific process is not the same as that which motivated Shelley to do so. She had the freedom to write down whatever fictionally-plausible scientific explanation she pleased, yet the fact remains that within the narrative she did not choose to do so. I use the word “choose” specifically, since, as I will demonstrate below, it was Shelley’s choice to avoid scientific language rather than a necessity stemming from her lack of knowledge of the language of contemporary science.

In his *Scientific Attitudes in Mary Shelley's Frankenstein*, Samuel Holmes Vasbinder traces the evidence in the novel for Shelley's familiarity with the scientific fads of the day, beginning with the incident in the 1818 edition of *Frankenstein* in which Victor's father constructs a "small electrical machine". Based on the writings of Joseph Priestly and his description of what was then currently known and possible to create in regard to electricity, Vasbinder argues that by having Victor's father build an electrical machine, Shelley "is aware that it was then the fashion to construct such pieces of equipment for private amusement and instruction" (68). Interestingly, this particular moment that reveals Shelley's engagement with popular science is one that is removed in the 1831 edition. Not only is Victor's familial relationship with science obscured, but so is Shelley's personal one. Moving beyond Victor's father's electrical machine and on to Victor's university education, Vasbinder notes that "Ingolstadt was a Jesuit school famous for its investigations and innovative attitudes and was considered 'a center for science'" (69). Shelley sends Victor to the particular place in which it would be narratively plausible for him to gain the education required for him to make his astonishing discovery. The setting for Frankenstein's scientific work and certain background details in the 1818 edition make it clear that Shelley was familiar with popular scientific trends and at least one of the major bastions of science of her day.

Shelley was not only familiar, however, with scientific trends as illuminated through the medium of educational entertainment or reputation. Vasbinder notes that Percy Shelley was known to have owned "a solar microscope...used by him for various scientific inquiries at Oxford" (72), the operation of which he links to Mary Shelley's

reference in *Frankenstein* to the ability of modern science to “mock the invisible world with its own shadows” (Shelley 1818 86), as Victor’s professor Waldman claims. The phantom-like images produced by a microscope such as Percy Shelley used would have probably been seen by Mary Shelley firsthand, allowing her to make this reference to the power of modern science based on her personal experience. Even aside from the particular case of the microscope, Mary Shelley’s relationship with Percy Shelley would have enabled her to at least observe, and perhaps participate in, contemporary scientific debates as well as the kind of experimental entertainments that Victor’s father might have performed with his electrical machine, in an intensely personal context. Vasbinder mentions that Shelley used the term “chemistry” in a manner informed by Humphry Davy’s *Elements of Chemistry*, “which she read and studied” (74). Furthermore, he writes that though “Mary was not in a position to be a practicing chemist...she was in an excellent position to understand its theory” (77). She was often “subjected to the intense conversations of Byron and Shelley” and “the latter, had he not been expelled from Oxford, perhaps might have become a research chemist” (77). Even after his later turn to reform and poetry “he evidently continued to be widely read in scientific philosophy” (77). In her introduction to the Oxford World’s Classics edition of *Frankenstein*, Marilyn Butler discusses how Percy Shelley “attended the London anatomy lectures of...John Abernethy” and became acquainted with William Lawrence, “who was soon to become Abernethy’s professional antagonist, and one of the most publicized scientists of the day” (xv-xvi).⁴ Furthermore, another member of the circles of Byron and the Shelleys at this

4 The antagonism between Abernethy and Lawrence stemmed from Abernethy's position that a

time was John Polidori, who, Vasbinder notes, “received his degree in medicine when he was nineteen, even then quite young for such an accomplishment”; he must have been highly talented, “well-grounded in contemporary science”, and “able to teach Mary some of the concepts and theory of eighteenth-century science when she needed help and clarification” (77-8). Even if she was not a scientist herself, the circles Shelley moved in frequently exposed her to either those who were, like Lawrence and Polidori, or those who had such interests, like Percy Shelley and Byron. In short, aside from any of her personal scientific reading, Shelley would have also been familiar with the spoken language of science as well as the conflicts, such as that between Abernethy and Lawrence, that could spring up with the propagation of various scientific ideas.

Within Mary Shelley's social context as described above, Butler's statement that “where science was concerned, Mary Shelley was necessarily a populist: she had to use what the public knew” (xxx) does not fully encompass Shelley's total interaction with the science of her day. Additionally, it does not fully address the choices she made in her writing regarding the science she did know. The evidence gathered by Vasbinder and Butler shows that not only did Shelley have more awareness of current trends in scientific thought than any particular member of the general public could be expected to have, but that she also had personal access to those who could explain various scientific concepts to her if her own reading proved insufficient. She was aware of the popular and used it, yet

“'superadded' element was needed, some 'subtile, mobile, invisible substance', perhaps a superfine fluid 'analogous to electricity' which would appear as a correlative to or confirmation of the idea of an (immortal) Soul” to explain biological life, while Lawrence made a strict “materialist case against spiritualized vitalism” (Butler xviii-xx). It is no great stretch to see how acquaintance with such a debate might have influenced Shelley's choice of subject matter.

still had more technical sources on which to draw. Knowing this, it would be dismissive and inaccurate to say that any vagueness or omission of scientific detail in the text can be explained by Shelly's ignorance of such matters. Then why?

Frankenstein's assertion to Walton that his knowledge is too dangerous to be shared seems, from a perspective outside the narrative, to imply that the omission of detail occurs out of narrative necessity. To keep the readers' interest, the plot cannot stop for details. However, such reasoning would need to be questioned, later on, in consideration of the abundance of detail the creature provides about his early experiences, such as when he tells of how he "learned to distinguish between the operations of my various senses" and his subsequent survival efforts and discovery of fire (Shelly 1831 86-88). I argue, then, that it is not narrative necessity, necessity within the plot, or ignorance of science that keeps Shelly silent on these matters, even going so far as to erase scientific details from the 1818 to the 1831 editions, but rather a desire to draw forth the terror that produces the sublime and can only be effected in fiction interwoven with science when the unknown effaces the explicitly known. Even though, as Vasbinder says, "a modern scientist would feel that Victor's investigation is rather crude, mixing chemistry and physiology irresponsibly and ignorantly", and "the time in which these experiments and observations were made had not yet formed the nice distinctions of the twentieth-century sciences" (76), science as a category of knowledge was rapidly defining itself in the first half of the nineteenth century, and boundaries between the known and the unknown were being drawn in the thirteen years between the two major versions of *Frankenstein*. Sydney Ross describes how, during the years that witnessed the

publication of Shelley's novel, "any kind of knowledge acquired by observation or experiment was freely called scientific and admitted to the company of the older sciences, which had not yet lost their claim to that title" (69). Nearly any kind of knowledge was potentially scientific, and "*philosophy* and *science* were interchangeable in certain connexions" (Ross 69). Ross notes, however, that such usage did not remain stable for long, and "the period of synonymity lasted about fifty years, approximately 1800-1850" (69). By the end of this period *science* and *philosophy* had, for the most part, taken up their distinct meanings as we currently understand them. By 1831, science was already shifting to a firmer meaning compared to the one it had in 1818, and thus for it to meet most effectively with the unknown in *Frankenstein*, Shelley had to adjust its presence and absence in the novel. Shelley wants to construct *Frankenstein* as a ghost story, a story born out of horror, or so she writes in her introduction to the 1831 edition. To this end she has removed some scientific allusions. More specific types of knowledge have become defined as scientific: more has been illuminated. The removed allusions lead to a preservation of the light-shadow or known-unknown ratios in the novel. Yet even in the 1818 edition Shelley kept Frankenstein silent regarding his process of creation. In order to create the appropriate atmosphere of fear and thus the sublime, *Frankenstein* could include only slight shadows of suggestive description, for to do otherwise would be to risk overwhelming the necessary darkness with scientific light, even if that light was ultimately not based in reality. The presence of the light of scientific knowledge must only be enough to delineate the darkness and thus the sublimity of the unknown and indescribable that eventually centers in the creature itself.

In *Frankenstein*, the horror caused by the hybridity of the known and the unknown is strong, and this revulsion is ultimately unable to be remediated or illuminated in order to preserve the effect of the sublime. In the novel, the greatest hybridity is focused in the creature, which Frankenstein briefly acknowledges to be a hybrid of the human and the non-specified animal, saying: “the dissecting room and the slaughter-house furnished many of my materials” (Shelley 1831 41). At this point in the process of making the creature, Frankenstein admits “often did my human nature turn with loathing from my occupation” (41), though his pursuit of scientific knowledge pushes him forward. Two kinds of purity or illuminated knowns are reacting to the hybrid here. The first, Frankenstein’s human nature, recoils from the mingling of the human with anything else and would gladly step away from such an endeavor. He knows himself as human and any mixing of the human with something other creates an unsettling unknown. However, since Frankenstein is such a good modern separator in cases outside of the creature, he allows the separate purity of his striving to achieve the goal of instilling life in inanimate matter to supersede his human response and convinces himself that the importance of his scientific project is enough to overcome the inherent repulsiveness of the hybrid creature that will prove his point. The human and the scientific are not allowed to mingle, even though such mingling might have prevented the later disasters authored by the hybrid result of the purely scientific endeavors. In this way, the assumed light of science enables the creation of the grand shadowy cipher of the creature, around which the rest of the narrative revolves.

The horror and sublimity of hybridity, which reveals itself in the revulsion shown to the creature, already a hybrid in some way—in consideration of the earlier mention of the slaughter house as a source for Frankenstein's materials—appears, as much as it can appear, most fully in the moment of the creature's animation. Frankenstein says he “had selected his features as beautiful” (43), which is already a warning that the creature is a collection of parts rather than a whole. When this collection begins to move, Frankenstein must face the horror of incongruous parts moving together. The “yellow skin” that “scarcely covered the work of muscles and arteries beneath”, the “hair...of a lustrous black”, the “teeth of pearly whiteness”, “watery eyes”, “shriveled complexion”, and “straight black lips” (43) all join to confront Frankenstein with an organized (because living and moving) hybrid that he himself has created. The joining of animal and human, beauty and ugliness, the creation of an unknowable, alien thing out of known components: this is the result of his great work. Such hybridity cannot be borne, though it has just been born, and Frankenstein says at this moment “the beauty of the dream vanished, and breathless horror and disgust filled my heart” (43). Towards this hybrid, there can be no hybridity of emotion. Either the thing is perfect, or it is an object capable of inspiring only loathing. Thus, after only a few moments observing the results of his work, Frankenstein, “unable to endure the aspect of the being”, “rushed out of the room” (43). When known to be hybrids, hybrids must be fled from, and the creature cannot exist in the same space as a true human being without extreme stress. Though the other humans in the story that encounter the creature do not have the same firsthand knowledge of his hybridity; they all react badly to the creature's presence, demonstrating the idea

that hybridity, even if not explicitly acknowledged, is horrifying and must be rejected.

The creature's unknowability is never modified.

One other instance in the novel in which the horror of hybridity becomes apparent is the episode wherein Frankenstein destroys the female creature that the original creature has asked him to create. As he nears the completion of this second creature, he considers as likely the possibility that "they might hate each other" since "the creature who already lived loathed his own deformity, and might not he conceive a greater abhorrence for it when it came before his eyes in the female form?" (Shelley 1831 146). Frankenstein further imagines that "she also might turn with disgust from him to the superior beauty of man" (146). Even hybrids are expected to find each other repulsive, something of which there is no desire to gain knowledge, and if they do not, Frankenstein envisions "a race of devils...propagated upon the earth, who might make the very existence of the species of man a condition precarious and full of terror" (146). Hybrids will beget hybrids, and as such they will not be able to live peacefully with pure humanity. This is to say, Frankenstein again cannot imagine a hybrid world. The creatures and humanity of course will not be able to live side by side; rather, one must annihilate the other over the course of time. Such thoughts are as unbearable as the sight of the hybrid creature himself, and Frankenstein thus "tore to pieces the thing on which I was engaged" (147). It began as pieces, and so as pieces it must remain. There can be no second hybrid, for this would inevitably lead to a world solely populated by such hybrids, a fate unimaginably horrific to such an apparent modern as Frankenstein. Though he bears responsibility for the creation of the first hybrid thanks to a modern sensibility that separates human feeling

from scientific work, after this incident his modern sensibility emerges in full force to reject that first hybrid as well as any others that might spring from it based on his actions. As adumbrated in Frankenstein's thoughts, any new world with such hybrids in it is simultaneously unimaginable and horrifying, and due to its very unknowability overrides any other emotions Frankenstein might have had towards this second project. Any possible pride he might have had in demonstrating refinements of his skills and any pity he might have had toward the first creature are erased in the fear of the unknown future, which, by washing away these other emotions, acts as the sublime. Through the destruction of the female creature, we are able to see the effects of such sublimity arising from the joining of the known and unknown on Frankenstein. We also take part in the speculation regarding the increase of such hybridity and thus, one hopes, become touched with such sublimity as well, as we realize that the facts we know in the story must now be mingled with a moment of uncertainty regarding the creature's reaction to such destruction.

II.

Robert Louis Stevenson walked an even finer line than Mary Shelley in creating the balance between the known and the unknown that would produce the effects of horror and sublimity in his works. As the nineteenth century progressed, so did physical science and its prestige, to the point where, as Ross states, it could "arrogate to itself the word previously used for all knowledge" (70). Science as a concept grew to contain the possibility of total explanation, of infinite light. The situation would have been one Stevenson invested in firsthand, since he was not just interested in scientific knowledge

as a means of producing greater realism in his stories, but was both a science writer and a fiction writer at different points in his life. Julia Reid notes that Stevenson was “born...to a family of lighthouse engineers” and “was educated to follow in the family profession” (4). In 1871, he “delivered a paper entitled ‘On a New Form of Intermittent Light for Lighthouses’”, and though this was his final action in the field before “abandoning engineering”, his participation in the Victorian scientific community does not end there (4). Furthermore, as Allen MacDuffie explains, Stevenson’s “earliest published work includes a paper presented to the Royal Society of Edinburgh, ‘On the Thermal Influence of Forests’ (1873)” (2). Stevenson knew what science writing was like: he had produced some of it and aided in its illuminating project. Furthermore, as part of the scientific community of his time, Stevenson moved in circles wherein he would have encountered many emerging and controversial scientific ideas of his time, such as the various competing theories of evolution, with which Reid claims he “engaged seriously—and often ambivalently” (5). The ambivalence seen by Reid, I suggest, relates to the two positions from which Stevenson encountered new scientific ideas: that of the scientist and that of the fiction writer. On the scientific side, Stevenson was able to write about his experience of the creative process to illustrate the psychological evolutionist idea of “the savage myth-making instincts which survive within a civilized human exterior”—this, in an essay that at least one other scientist, Myers, called a “valuable...contribution to experimental psychology” (Reid 27-8). Even though Myers was not a mainstream researcher, he was still a part of the scientific community and was able to evaluate Stevenson’s essay from the perspective of a scientist working with experimental

psychology, and not as a layman. On the fiction-writing side, Stevenson integrated the ideas he put before the scientific community for narrative and dramatic purposes. The topic of his essay for the scientific community sounds like a more personalized and abstract version of the double life conceit that forms the heart of *Strange Case of Dr Jekyll and Mr Hyde*. With this essay and his other scientific writings, it appears that Stevenson, in addition to being generally involved in various scientific fields and the production of knowledge in these fields, was also closely engaged with the production of scientific fact; he worked in the same field from which he drew background for his stories and which he used in producing scientific non-fact. He knew exactly how far the light of knowledge would shine if he decided to turn it on.

Thanks to his position as one who in certain cases is to be depended on for scientific fact rather than science fiction, Stevenson had to tread more carefully than Shelley, or, as will be seen later, Lovecraft, when crafting the darkness of the unknown in his work and making sure that it is not mistaken for light. Shelley, for one, never claimed to be a scientist. Lovecraft of course had a desire for realism that led him to carefully research the scientific backdrops of his stories and to make sure that the proper scientific tests were conducted on the anomalous objects within them. But he never claimed to be a producer of fact and was therefore safe from the danger that those who knew him and his work would ever think that he was making such a claim. In Stevenson's case, both those who knew nothing about his work as well as those who knew all his writings would have to face a moment during which the claim to factual status of any particular piece of writing was uncertain. For this reason, if Stevenson wanted to make it clear that his

writing was not meant to be science fact, he had to include some marker within the text that unambiguously communicated its fictionality. For a writer who used words to convey ordinary scientific information, the best option in fiction to make it clearly fictional seems to have been to avoid the use of words to convey such information at all. For Stevenson, only absence can effectively convey the unknown.

Stevenson's engagement with science and his avoidance of descriptions that correspond to his development of both horror and the sublime appear most strongly in *Strange Case of Dr Jekyll and Mr Hyde*, particularly in the chapter somewhat misleadingly titled "Henry Jekyll's Full Statement of the Case". Notably, the inclusion of such a chapter stands in contrast to *Frankenstein*, where the unspoken desire of Walton to hear Frankenstein's full statement was rejected even before it could be articulated. In the several decades that have passed since *Frankenstein's* publication, the increase in available scientific knowledge seems to require that more scientific light be provided before the force of darkness and the unknown is accepted. Yet, as should be expected from the discussion thus far, Jekyll's description of what exactly was happening on the scientific front during the events of the story will be notably incomplete in some crucial areas. When Jekyll describes his fascination with the idea that "man is not truly one, but truly two", and his desire to separate these two (an impulse towards the purification project that he does not realize will lead to parallel, unknown, translated, hybrid, results), he says that he did not simply think of this as a metaphysical mental exercise, but saw that "a side light began to shine upon the subject from the laboratory table" (52-3). In his scientific inquiries, he begins to "perceive more deeply than it has ever yet been stated,

the trembling immateriality, the mist-like transience, of this seemingly so solid body in which we walk attired” (53). With this statement Dr Jekyll places himself at the very edge of known science within the world of his narrative: with the knowledge of what statements have been made previously about the immateriality of matter, he has found himself able to understand this concept more fully, and, as we shall see, in a practical way. Dr Jekyll states that he has discovered “certain agents...to have the power to shake and pluck back that fleshly vestment” (53). However, this statement becomes the first site of withheld description as he does not offer any insight as to what these “certain agents” could be. Then he tells his readers (Utterson, within the story and us, without it) he “will not enter deeply into this scientific branch of my confession” because his “discoveries were incomplete” (53). This last statement, Jekyll’s purported reason for his silence, is absolutely critical to the story’s ability to define itself as not-science and as something that does not shine a true light from any direction.

Though Jekyll’s inquiries are scientific, and he is aware that he is working on the furthest edges of discovery, incomplete knowledge prevents him from saying anything at all: this is not science. It is not science not only because the description is not there, it is also not science because Jekyll says that he should not relate his incomplete discoveries. In scientific research, progress is made very slowly in the majority of cases. A scientific article may describe what happens in some experiment or natural phenomenon without being able to describe exactly why the phenomenon occurred or the full implications of what was observed, because in some cases those aspects are not immediately evident. The important thing is to mediate what was observed in such a way that others will be

able to determine if the referent can be recreated and re-observed, or to mediate what was observed so that others in the scientific community may use that information to figure out what exactly is going on. By refusing to give a detailed description of what he did in the story due to the incompleteness of his research, Dr Jekyll has removed himself from the scientific community within the world of the story for a reason that does not fit with the realities of the production of scientific knowledge. Dr Jekyll behaves in this way, despite being a “F.R.S.”—a “Fellow of the Royal Society” who “has done sufficiently pioneering work in science to be elected Fellow of the most influential scientific society in London”—because there are out-of-story reasons for him to not behave as a scientist (Stevenson 11, Luckhurst 185). What Dr Jekyll may write in his statement of the case is only as much as Stevenson can let him write in order for the story as a whole to remain more in the darkness of the terrifying unknown than in the light of the becoming known despite dealing specifically with a scientific experiment and its aftermath.

The effects of Stevenson’s efforts to keep the story appropriately dark are further visible in the pieces of limited information that Jekyll is allowed to say or allows himself to say about the experiment. Just when description is most expected or necessary, it is absent. Jekyll provides such details as the exact narrative of his actions on the night of his first ingestion of his drug, but nearly everything about the drug itself is shrouded in a fog of hints and omissions. Jekyll mentions a purchase “from a firm of wholesale chemists, a large quantity of a particular salt which I knew, from my experiments, to be the last ingredient required” (Stevenson 54). Notably missing is any description of what these experiments were, as well as anything that would make it possible to identify the salt as

anything other than (probably, given the terminology) an ionic compound. Though in the story Jekyll's drug is a substance that has been created through a process of careful experimentation and a combination of various ingredients, the information relayed to the reader regarding this process is scanty. Of the drug, it is known that it contains a "particular salt", and when initially mixed the ingredients will "boil and smoke together in the glass" (54). No specific real world referent or scientific experiment can be tied to such sparse description; only a thin sliver of the light of common knowledge sets off the unknown darkness of the drug.

Certain failures of preparation on Jekyll's part during his first human trial reveal yet more of Stevenson's deliberate obscuring of information. During his first test, Jekyll records "a grinding in the bones, deadly nausea", then the feeling of being "younger, lighter, happier in body" and finally an awareness that he "had lost in stature" (54). His test seems to have been successful in demonstrating that this substance he invented is able to manipulate seemingly solid matter. However, despite the expected result of the test, Jekyll admits "there was no mirror, at that date, in my room" (54). Jekyll has no way of making the most basic visual observations of the results of the experiment for which he has prepared for so long. What are we to make of this? His goals for the experiment require him to expect some sort of physical transformation. Is Jekyll sloppy and forgetful? This should be discounted because it would clash with his characterization throughout the rest of the story. Another explanation is that Stevenson did not think that a mirror would be an appropriate piece of equipment for Jekyll to keep in his laboratory, but given Stevenson's engagement with science it does not seem that the mirror in the

laboratory would be rejected on those grounds, especially considering the nature of the experiment Stevenson is having Dr Jekyll perform. Stevenson must know that Jekyll should have a mirror in his laboratory for this particular experiment. So why is the mirror absent? The mirror is absent because in being absent it performs an important function: it prevents Jekyll from getting the initial results he needs if he wants to make an accurate scientific recording of his work for posterity—it prevents him from making a “full statement of the case”—and it gives Stevenson an excuse for the initial silence regarding the visual results of Jekyll’s experiment.

The breaking of the silence regarding this most important result only occurs after a false start that seems to mock any eagerness possessed by a reader to finally know, with scientific accuracy, what has happened to Henry Jekyll. Jekyll describes making his way “through the corridors, a stranger in my own house” so that he can get to his room and see “for the first time the appearance of Edward Hyde” (55). In a moment of beautiful frustration for the reader, the next sentence is not a description of Hyde at all. Instead, Jekyll digresses, stating “I must speak here by theory alone, saying not that which I know, but that which I suppose to be most probable” (55). After this sudden swerve, several more sentences must pass by before Hyde’s appearance is outlined, though it remains only an outline—describing someone’s face as an “ugly idol” is not very specific (55). Indeed, the non-descriptive sentence that appears where a description is expected should warn readers, both inside and outside the story, that nothing is really going to be revealed. Jekyll says that he speaks “by theory alone” and his “most probable” suppositions: is he talking about why Hyde looks the way he does or how he looks in the

first place (55)? At the moment of first reading this is unclear and thus implies a Hyde who, though physical, has only a theoretical appearance. In this way, what is perhaps the most significant aspect of Jekyll's experiment both for Jekyll and for everyone who encounters it in narrative form is left vague by Jekyll, positioned as something that cannot be brought into the light like any other ordinary object subject to scientific scrutiny. The night of the experiment never fully dawns, and we are left with a Hyde that remains hidden in the darkness—undefined and still able to be terrifyingly sublime when encountered by others.

As a both an unseen focal point and as the intriguingly unreadable means of understanding the horror of hybrids and their capacity to produce sublimity in *Strange Case of Dr Jekyll and Mr Hyde*, the figure of Mr Hyde is first shown explicitly in Dr Jekyll's stated purpose for his experiment and later, implicitly, in the reactions of the other characters to Hyde as the result of that experiment. As noted before, in his studies Jekyll discovers "that man is not truly one, but truly two" and acknowledges that in the future it may be discovered "that man will be ultimately known for a mere polity of multifarious, incongruous, and independent denizens" (52-3). Man is inherently a hybrid. While this at first may seem like a very non-modern idea, the actions Dr Jekyll takes once he obtains this revelation clearly belong to the purifying practices of Latourian modernity that will necessarily produce a terrifying, rather than neutral, hybrid shadow-half. Jekyll thinks that if the separate elements of man's personality "could but be housed in separate identities, life would be relieved of all that was unbearable", and states outright: "it was the curse of mankind that these incongruous faggots were thus bound together—that in

the agonized womb of consciousness, these polar twins should be continuously struggling” (53). In sharp contrast to the scientific ambiguity of his description of the experiment he undertakes to alleviate this curse, Jekyll is remarkably precise and unambiguous here. Revulsion with the common hybridity of humanity leads him to an obsession with separating the varied aspects of human personality, pointing him down the path of reckless but successful experimentation that produces a supposedly purified, if purely evil, humanlike being.

Dr. Jekyll, however, is not the only one in the tale to feel revulsion at apparent hybridity. While Dr. Jekyll sees hybridity in the common lot of human beings and seeks to correct it through scientific intervention, other characters see hybridity in Mr Hyde, the supposedly purified result of Jekyll’s experiments. Mr Enfield, describing his first encounter with Mr Hyde, notes, “I had taken a loathing to my gentleman at first sight”; he also says that another person, a doctor, who was also present at the time, turned “sick and white with the desire to kill him” (7). Something about Mr Hyde inspires instinctive loathing, and it is not purity that other characters perceive in him. When Mr Utterson, the viewpoint character for much of the early part of the story, finally sees Mr Hyde, he describes him in this way: “Mr Hyde was pale and dwarfish, he gave an impression of deformity without any nameable malformation, he had a displeasing smile, he had borne himself to the lawyer with a sort of murderous mixture of timidity and boldness” (15). Many of the things that add together to make Mr Hyde unpleasant are marks of hybridity: he is simultaneously deformed and normally formed; his smile, an expression that is reassuring on most, is nasty on him; his manner combines opposite moods. There is

something not quite right and human about Mr Hyde, though it is impossible to say specifically what this is. Even while being observed Hyde is impossible to see, unsettling Utterson and the readers. When Jekyll tried to eliminate hybridity in humanity he ended up with Mr Hyde, a man whom the other characters see as a horrible hybrid of the human and the unnameable nonhuman. Such hybridity overwhelms normal social emotions, and in the instant desire to murder Hyde that Utterson observes in the doctor present at their first encounter with Hyde, readers face an undeniable sublimity mingled with horror. Though hybrids may be defined differently by different characters, the overarching fear and loathing they cause make it clear that this work participates both in Latourian modernity's wish to purify and a desire to produce the effect of the sublime as defined by Burke, which requires some slight illumination of the known to be joined with a greater horrifying unknown. The hybrid serves as a useful shadow in the process of causing a stronger emotional reaction in readers than clearly delineated inhumanity would provide.

III.

Finally, H.P. Lovecraft also created not-quite-visible scientific moments in his fiction, moments that contain the obscurity necessary to produce the sublime as the range of scientific knowledge grew ever wider. Much like Mary Shelley, Lovecraft was not a scientist himself, but he had access to a wealth of scientific information and did choose to use it in some contexts. Fritz Leiber, Jr, in *H.P. Lovecraft: Four Decades of Criticism*, notes that "Lovecraft devoted very little attention to novel inventions, to scientific speculations for their own sake," but the "scientific speculations the Old Gentleman did make were very clever and most of them were carefully researched"; "his scientists and

their paraphernalia—their personalities and mannerisms and daily professional work—were convincingly presented” (143). Lovecraft remains apart from certain aspects of scientific inquiry, but this is quite understandable in the context of his fiction. Inventions do not fit very well with the cosmic tenor of his writings, and scientific speculation for its own sake is relatively useless for the author, who must of course fit it in to some narrative, causing it no longer to exist simply “for its own sake”. In his field (if such a term is appropriate here), however, Lovecraft did do his research and did not want to put just anything into his stories with the justification of their being “just fiction”. Slightly before his discussion of Lovecraft’s research, Leiber describes the “dry scientific language” used in stories like *At the Mountains of Madness* and asserts that “Lovecraft helped lead the way toward greater realism in...speculative fiction” (142-3). He could write as scientists did, he could and did do research into the scientific speculations he wanted to make, and he was a proponent of realism—and the thus the light of understandability—in his fiction. However, as Christopher P. Toumey observes, during the decades in which Lovecraft was writing, optimism about scientific progress was paired with a critique of science through the figure of the mad scientist in various media, a pairing that grew “harsher still when films were launched” (434). Lovecraft wrote his stories in an ambivalent time, when technological wonders were contrasted with fears that scientists, through their work, “threaten the persistence of Western culture”, as Read Bain stated in 1933 (Allen 542). In “The Colour Out of Space”, such ambivalence appears in the form of scientific absences as well as some particularly unhelpful scientists, demonstrating that in certain cases, for Lovecraft, the desire for realism was

tempered both by the concerns of his time and the knowledge of how to effectively produce the sublime using the fear potential of scientific investigation and scientific *non-*investigation.

“The Colour Out of Space”, published in 1927, tells of the strange phenomena that occur on a farm after a meteorite lands beside the well of a farmer named Nahum Gardner (435). The story begins when the narrator, a surveyor, arrives to inspect the land for the new reservoir that will soon flood the valley in which the unusual events took place. The odd hints he hears about the past encourage him to seek out the one person who was present when the strange things happened, an old man named Ammi Pierce. Before entering Pierce’s tale fully, the narrator mentions that when Pierce was telling him the tale, he “often...had to recall the speaker from ramblings, piece out scientific points which he knew only by a fading parrot memory of professors’ talk, or bridge over gaps, where his sense of logic and continuity broke down” (Lovecraft 439). The mention of piecing out scientific points shows that the narrator is someone who has had some scientific education and that there was an attempt made to understand the strange events in a scientific frame. Additionally, we are to understand that whatever factual or scientific relation we receive from this story, it is three times removed from the immediate experience that inspired it. The object of inquiry (revealed to be a meteorite) has been remediated by analytic experiments, which have then been remediated by Pierce’s story, which is then remediated by the narrator’s retelling, which provides the first hint at this story’s method of producing scientific obscurity or darkness: unlike illuminatory scientific writing, it makes a point of its non-immediacy. Still, at this point we have an

assurance that the weirdness of the meteorite has been addressed by science, and that the narrator has worked to fill in the gaps of scientific knowledge in Pierce's memory.

However, as may be expected from my inclusion of this story as an example, these assurances come to little, and the scientific dialogue about the meteorite peters out when it is most likely to be specific and most needed—both in-story and out.

The promises of scientific explanation for the oddities of the meteorite begin right after it lands, following the appearance of a “white noontide cloud, that string of explosions in the air, and that pillar of smoke from the valley far in the wood” (Lovecraft 440). Professors from Miskatonic University “hastened out the next morning to see the weird visitor from unknown stellar space” (440). Such statements imply full confidence in the ability of science to explain the meteorite: it is not something that, like a vampire or werewolf, requires the cover of darkness—it appears in the day. Also, it is not left to fester untouched. There is no gothic deferral here; the meteorite is new and it will be examined right away in the brightness of a new day. As soon as the scientists begin to physically interact with the anomaly, however, the bright promise begins to become obscured. Nahum tells the scientists that the meteorite has shrunk since it landed, and “the wise men answered that stones do not shrink” (440). The scientists refuse to allow Nahum's observation to illuminate their work, which begins the chain reaction of darkness and obscurity that allows the sublime horror of the ending to take place. Nahum's lack of more specific knowledge and the scientists' dismissal of that knowledge prevent any information from being gained here of what the object is. Though the

scientists do agree to work with the meteorite and take samples to study, the problem of specifically describing it persists.

Through Pierce's story, we are told that when the scientists took a sample of the object, they found it "so soft as to be almost plastic" and that they had to carry the sample in a bucket because it was hot and would not cool down (Lovecraft 440). In the lab, the specimen eventually evaporates away (and takes the glass beaker it was stored in with it), but not before some particularly non-illuminating tests are performed—with the passage of time, neither Shelley's outright refusal nor Stevenson's vagueness is accepted as enough scientific light to make the darkness stand out, so more scientific techniques are described at this point, though again, such scientific explanation ultimately fails, despite there being more of it. Still described as a "stone," the sample "acted quite unbelievably in that well-ordered laboratory; doing nothing at all" (441). References to various scientific tests and pieces of equipment are given: heating on charcoal, the borax bead, the oxy-hydrogen blowpipe, immersion in over a dozen different reagents. None of these have any effect, and the results of the tests provide only these few pieces of information: "it appeared highly malleable...its luminosity was very marked...upon heating before the spectroscope it displayed shining bands unlike any known colours of the normal spectrum" (441). The scientists also conclude that it is a metal because it is magnetic. The positive facts are few, and thus, even within the well-developed and well-lighted scientific framework of the laboratory, the object manages to persist in its darkness and preserve the possibility that it will engender terror rather than mere curiosity.

This negative description, especially the non-description of the spectroscope test, prevents any comparison to exotic materials that exist outside the story. Lovecraft clearly knows the purpose and method of the spectroscope test—a means of determining a material's composition in which its atoms are excited by heating. When the excited atoms return to their ground state, they will only release electromagnetic radiation in certain wavelengths that correspond to the particular substance (a result implied by quantum physics).⁵ His description of the test of the sample severs two links to any real scientific results in its very refusal of description. The bands are “unlike any known colours of the normal spectrum” (Lovecraft 441), which means that their locations in the visible spectrum do not match up to any of those observed previously in any other substance. However, this could be said of any substance new to science and needing to be described, save for the other implications in the spectroscopic results. The observed spectrum for this sample is described visually, but the colors shown are entirely unknown. Here is where non-description fully settles into unassailable obscurity. Even the most perplexed real-world scientist would try to produce a description of the colors for the simple reason that the normal visual spectrum is quite small—ranging from wavelengths about 700 nanometers in size on the red end to wavelengths of about 400 nanometers on the violet end⁶—and well mapped: nothing can appear in that range as normal electromagnetic radiation and be unnameable. Whatever the spectroscopic analysis of this substance

5 As an undergraduate at DePauw University—double majoring in physics and English literature—I spent part of a summer working at the DePauw Institute for Girls in Science teaching middle schoolers about this investigative method and the theory behind it. We looked at elements such as neon and argon, however, not anomalous meteorites.

6 In comparison, the complete electromagnetic spectrum includes wavelengths ranging from several meters (radio waves) to less than a nanometer (gamma rays) (Carroll, Ostlie, 66).

shows, it is not strictly a “colour”. The color/non color aspect of this meteorite is brought to the forefront in the story when the scientists return to Nahum’s farm to tell him what the tests showed. They go to get another sample of the meteorite and find “a large coloured globule embedded in the substance”, the appearance of which resembles the results of the spectroscopic analysis, and is “almost impossible to describe; and it was only by analogy that they called it colour at all” (442). This visual effect of the object, and, later in the story, of the plants, animals, and people affected by the object, is consistently described in these terms. An unknown color permeates everything, or at least something called a color because there is no better word for it—no possible description, albeit one better than none.

To put it another way, the visual effect of the spectroscopic bands, the globule in the meteorite, and later the vegetation that grows up around the landing site, cannot be illuminated at all. Though the tools of science have been used to investigate it, the substance of the meteorite refuses to yield any results that can place it within an understandable context, and the aspect of it that is most unusual may be seen but not described in a way that allows it to be understood by those who were not present at the site of investigation. Lovecraft’s refusal to provide clues to what Nahum, his family, and the scientists saw allows him to use a scientific framework for the piece and so make it more realistic. Much of the horror of the story could occur in the same way if Nahum had never reported the object, but such a decision would have been inexplicable and less realistic, especially if made by someone who is presumably unaware of being part of a horror story. With this realism, however, comes the danger of creating a story that may

merely be strange but knowable, rather than one that partakes of the full horror of inexplicability. Lovecraft makes sure to avoid the breaking of his atmosphere of horror by both refusing description and preventing it. In the investigation the scientists undertake in the story, “water did nothing” to the substance (441). This means that a piece of it could have easily been both submerged and weighed, and its density determined. Instead, the concept of density is never even mentioned in the description of all the scientific analysis. It must be ignored so that even with the rest of the scientific tests and the relatively sober description of them, a basic piece of information is absent, and the piece cannot then be a true scientific description. However, this is not enough. Even though the density of a substance is an important part of any scientific description, it is not obviously missing in the extensive number of tests Lovecraft enumerates in this section in order to show that the investigation was thorough. Thus, beyond leaving out the notation of the density of the object, Lovecraft makes a special point of the impossibility of describing the visual effects of the substance. In real scientific writing, some attempt would have been made to describe these effects, since that is the business of scientific writing: to explain and illuminate every aspect of the object being investigated, no matter how anomalous, so that no part of it remains in the shadows. In this way, despite whatever other realistic or detailed scientific description is given in regard to the anomalous object, one aspect that is written and defined as impossible to be mediated prevents the realistic description from actually casting any revelatory light.

The hybridizing horror in “The Colour Out of Space” stems from the influence of this observed yet indescribable meteorite causing detrimental minglings of living

organisms, including plants, animals, and people, and something other, unknown, and undefined. In the case of the fruit on Nahum's farm, it grows "to phenomenal size and unwonted gloss" but "not one single jot was fit to eat. Into the fine flavor of the pears and apples had crept a stealthy bitterness and sickishness, so that even the smallest bites induced a lasting disgust" (Lovecraft 444). Skunk-cabbages growing in the woods grow larger than anything ever seen before, "and they held strange colours that could not be put into any words. Their shapes were monstrous" (445). At night, the trees "swayed ominously in the wind" and "Thaddeus...swore that they swayed also where there was no wind" (446). Most unnaturally, "a dim though distinct luminosity seemed to inhere in all the vegetation" (448). Such strangeness starts to cause the Gardners to fail "curiously both physically and mentally" (448). Something is deeply wrong at the Gardner farm, something related to the joining of the unearthly with the earthly, the nonliving with the living. Notably, by this point in the story, despite all the strange phenomena, the scientists have stopped coming to investigate, "for superstitious rustics will say and believe anything....so all through the strange days the professors stayed away in contempt" (446). In refusing to believe Gardner's reports of the phenomena, the scientists emphasize the obscurity of the events taking place on the farm and effectively say that light has no place there. For readers, the scientists' reactions again bring the idea of the unknown to the forefront in contrast to the possibility of another scientific investigation such as the (mostly unhelpful, but still performed) one conducted on the meteor. Yet the meteor's effects are not limited to plants, for they change animals into monstrously unknowable hybrids as well. Footprints of animals in the snow have "something not quite right about

their nature and arrangement...they were not as characteristic of the anatomy and habits of squirrels and rabbits and foxes as they ought to be” (444-5). A woodchuck caught by some hunters near Gardner’s farm has “proportions...slightly altered in a queer way impossible to describe, while its face had taken on an expression which no one ever saw in a woodchuck before” (445). Upon seeing it “the boys were genuinely frightened, and threw the thing away at once” (445). In these cases, while the animals are definitely hybrids of their proper selves and something else, such hybridization is again refused remediation for the reader as well as those within the story, since the throwing away of the disturbing woodchuck prevents anyone but the hunters from seeing it and thus any systematic/scientific attempts to make it comprehensible. The hybrids are ultimately seen by very few individuals, remaining shrouded in mystery because they are horrifying within the story and because such mystery increases the horror felt by the reader.

Finally, beyond the plants and animals, the meteorite manages to affect the humans within its range of influence, producing what the story sees as the most ghastly hybrids of all, which cause the most unnamable things to occur. The first person to be affected, and the most visibly recorded in the story, is Mrs. Gardner. She begins to deteriorate mentally and raves that “something was fastening itself on her that ought not to be” (449). She can tell that she is being made into some sort of hybrid, and is horrified by the process, though she cannot explain exactly what is wrong. Physically, her “expression changed....the boys grew afraid of her....she...ceased to speak and crawled on all fours...she was slightly luminous in the dark” (449). She becomes something not entirely human—a combination of the human and whatever unearthly unknown that has

been changing the plants and animals. As time goes by her humanity diminishes, but there remains a spark of earthly life in her even up to the moment of her death. After some time passes on the farm, the animals and one of the Gardners' sons suffer and die from a bizarre disease which slowly turns them gray and brittle. Ammi Pierce, coming to the house to see if there is anything he can do to help, finds that Mrs. Gardner also "had shared the nameless fate of young Thaddeus and the live-stock" (454). Initially thinking that she is well and truly dead, a closer look reveals this to be false, and "the terrible thing about the horror was that it very slowly and perceptibly moved as it continued to crumble" (454). This moment shows the ultimate horror inherent in the hybridity of the known and unknown that pervades the entire work, even beyond that already shown with the plants and animals. Mrs. Gardner's condition is entirely the result of the joining of the human and the nonhuman, and is so horrifying that it must be "nameless". The moment of horror is preserved by not describing what has happened in details that go beyond the barest suggestive outline of the event. All the readers or the narrator can know—"Ammi would give me no added particulars of this scene"—is that one way or another, "the shape in the corner does not reappear in his tale as a moving object" (454). What used to be Mrs. Gardner looks dead, or at least looks like no earthly living thing. It is a combination of living and dead, human and nonhuman, and it is at this point in the story where what is observed is blatantly described as horrifying but other description utterly fails: the hybrids formed by joining the known and the unknown kill description with the abomination of their existence and allow the sublime stemming from terror to be felt by readers as well.

Within the three works described above, in perhaps such a powerful degree as to constitute the defining characteristic for a subgenre of science fiction to which they all belong, the interplay of light and darkness, known and unknown, and the pure and the hybrid compose a means of producing the effect of the sublime in a way peculiar to works which draw from known science as starting points for their speculative plots. The mysterious process by which Frankenstein instills life in his creation; the unknown impurity that allows Dr Jekyll's vague drug to be so astonishingly effective; and the impossible-to-see almost-colors of the meteorite found on Gardner's farm: in their indelible impressions upon the mind of the reader despite the fact that they are barely present, all testify as to the important role obscurity plays when the goal is to produce the highest emotional effect. Within the works selected, science serves as an illuminating concept that, in effect, only serves to make clear that, outside of it, nothing is clear. In knowing the known, the fear of the unknown becomes possible and the boundary between the two becomes powerful. This effect is multiplied within *Frankenstein*, *Strange Case of Dr Jekyll and Mr Hyde*, and "The Colour Out of Space" when the hybrids that cross that boundary do so in the undeniably present, but necessarily underdescribed, forms of the creature, Mr Hyde, and all the creatures (including Nahum's wife) that are affected by the meteorite. The unknown joins with the known, while the careful managing of detail allows the light of the known to shine no further into the darkness of the unknown than the authors believe necessary for the production of the effect they desire. And it is the effect that is of greatest importance here. Given the

unique relationship each author described above had to the scientific community of her or his day, it would not be accurate to say that the similarities of effect within their writings, when it comes to the interaction of science with speculation, stem primarily from their true feelings regarding scientific investigation. Rather, it is the ultimate production of the sublime that drives the choices they make in their descriptions. In consideration of this, the works described above should not be decried for promoting suspicion of science or for advocating an irrational view of the world. Instead, they rather should be praised for recognizing that rationality and irrationality will coexist with each other—at the very least until perfect knowledge is instantly disseminated through the minds of all humans at birth (and maybe even afterward). This state is not a state to lament, but a means of producing the power in literature, specifically science fiction, to stay lodged in the mind of the reader long after reading, to encourage thought by means of discomfort, and of encouraging continual pressing on the boundary between the known and the unknown, allowing the possibility for continual new illuminations and the continual discovery of new shadows. In this form of science fiction, science cannot exist without mad science, and so the scientist and the mad scientist may as well embrace. They'll get much more done working together than as individuals.

Bibliography

- Allen, Glen Scott. "Master Mechanics & Evil Wizards: Science and the American Imagination from Frankenstein to Sputnik." The Massachusetts Review. 33.4 (1992): 505-58.
- Butler, Marilyn. Introduction. Frankenstein: 1818 Text. By Mary Shelley. Oxford: Oxford University Press, 1994. ix-li.
- Burke, Edmund. A Philosophical Enquiry Into the Origin of Our Ideas of the Sublime and Beautiful. London: R. and J. Dodsley, in Pall-mall, 1757.
- Carroll, Bradley W. and Dale A. Ostlie. An Introduction to Modern Astrophysics. 2nd ed. San Francisco: Pearson Education, Inc, 2007.
- Latour, Bruno. We Have Never Been Modern. Cambridge: Harvard University Press, 1993.
- Leiber Jr, Fritz. "Through Hyperspace With Brown Jenkin: Lovecraft's Contribution to Speculative Fiction." H.P. Lovecraft: Four Decades of Criticism. Ed. S.T. Joshi. Athens: University of Ohio Press, 1980.
- Lovecraft, H.P. "The Colour Out of Space." Masterpieces of Science Fiction. Ed. Sam Moskowitz. Cleveland: The World Publishing Company, 1966. 435-68.
- . Supernatural Horror in Literature. New York: Dover Publications, Inc., 1973.
- MacDuffie, Allen. "Irreversible Transformations: Robert Louis Stevenson's *Dr. Jekyll and Mr. Hyde* and Scottish Energy Science." Representations. 96.1 (2006): 1-20.
- Reid, Julia. Robert Louis Stevenson, Science, and the *Fin de Siècle*. New York: Palgrave Macmillan, 2006.

- Ross, Sydney. "Scientist: The Story of a Word." Annals of Science. 18.2 (1962): 65-85.
- Shelley, Mary. Frankenstein; or, The Modern Prometheus. London: Lackington, Hughes, Harding, Mayor, & Jones, Finsbury Square, 1818.
- . Frankenstein: or, The Modern Prometheus. London: Henry Colburn and Richard Bentley, New Burlington Street, 1831.
- Stevenson, Robert Louis. Strange Case of Dr Jekyll and Mr Hyde and Other Tales. Ed. Roger Luckhurst. Oxford: Oxford University Press, 2006.
- Suvin, Darko. Metamorphoses of Science Fiction. New Haven: Yale University Press, 1979.
- Toumey, Christopher P. "The Moral Character of Mad Scientists: A Cultural Critique of Science." Science, Technology, & Human Values. 17.4 (1992): 411-37.
- Vasbinder, Samuel Holmes. Scientific Attitudes in Mary Shelley's Frankenstein. Ann Arbor: UMI, 2000.